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**FAX TRANSMISSION TO USPTO**

TO: Commissioner for Patents  
Attn: Examiner Hashem Farrokh  
Patent Examining Corps  
Facsimile Center  
Alexandria, VA 22313-1450

FROM: Jason S. Feldmar  
OUR REF.: ARC9-00-055US1 (MCM)  
TELEPHONE: (310) 642-4141

Total pages, including cover letter: 16

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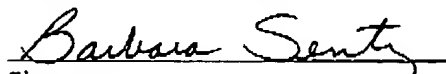
Title of Document Transmitted:	TRANSMITTAL SHEETS AND AMENDMENT UNDER 37 C.F.R. 1.116 WITH REPLACEMENT ABSTRACT
Applicant:	Lawrence Yium-chee Chiu et al.
Serial No.:	09/851,452
Filed:	May 7, 2001
Group Art Unit:	2187
Title:	METHOD AND APPARATUS FOR A GLOBAL CACHE DIRECTORY IN A STORAGE CLUSTER
Our Ref. No.:	ARC9-00-055US1 (MCM)

Please charge all fees to Deposit Account No. 50-0494 of Gates & Cooper LLP.

By: 

Name: Jason S. Feldmar  
Reg. No.: 39,187

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Signature

April 15, 2005  
Date

Due Date: April 28, 2005

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Lawrence Yium-chee Chiu et al. Examiner: Hashem Farrokh  
 Serial No.: 09/851,452 Group Art Unit: 2187  
 Filed: May 7, 2001 Docket: ARC9-00-055US1 (MCM)  
 Title: METHOD AND APPARATUS FOR A GLOBAL CACHE DIRECTORY IN A STORAGE CLUSTER

## CERTIFICATE OF MAILING OR TRANSMISSION UNDER 37 CFR 1.8

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By: 

Name: Jason S. Feldmar

## MAIL STOP AMENDMENT

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

We are transmitting herewith the attached:

- ☒ Transmittal sheet, in duplicate, containing a Certificate of Mailing or Transmission under 37 CFR 1.8.
- ☒ Amendment Under 37 C.F.R. §1.116.
- ☒ Other Enclosures: Replacement Abstract

## CLAIMS PRESENT

Claims Remaining:	Highest Number Previously Paid For:	Number Extra	Rate	Fee
<b>Total Claims</b>				
28	33	0	x \$50.00	= \$0.00
<b>Independent Claims</b>				
3	3	0	x \$200.00	= \$0.00
MULTIPLE DEPENDENT CLAIM FEE				\$0.00
TOTAL FILING FEE				\$0.00

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Los Angeles, CA 90045

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By: 

Name: Jason S. Feldmar

Reg. No.: 39,187

JSF/bjs

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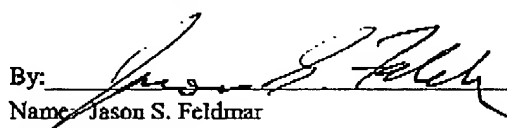
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APR 15 2005

RESPONSE UNDER 37 C.F.R. 1.116

EXPEDITED PROCEDURE

EXAMINING GROUP 2187

Due Date: April 4, 2005

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Lawrence Yium-chee Chiu et al.	Examiner:	Hashem Farrokh
Serial No.:	09/851,452	Group Art Unit:	2187
Filed:	May 7, 2001	Docket:	ARC9-00-055US1 (MCM)
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By:   
Name: Jason S. Feldmar

AMENDMENT UNDER 37 C.F.R. §1.116

MAIL STOP AF  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action dated February 4, 2005, which was made final, please enter the following amendments in the above-identified application.

IN THE SUMMARY

Please amend the paragraph on page 6, lines 13-17 as follows:

The symbolic list in the cache directory provides a history of the nodes that have previously performed I/O operations. When data is requested, embodiments of the invention look at the symbolic list to determine which node's cache contains the requested data. Primary and secondary nodes are utilized for storing cache. The node that receives the request for modifying data is identified as a primary node. If the symbolic list indicates that the data is not currently in the cache of any node in the storage cluster, any node in the storage cluster may be selected as the secondary node. Alternatively, if the symbolic list indicates that an original primary node in the storage cluster maintains the data in cache, the original primary node is selected as the secondary node. Once a new write I/O operation is performed, the symbolic list is updated to provide for the new I/O operation.

Please amend the paragraph on page 6, lines 18-19 as follows:

Additionally, embodiments of the invention provide Fast write support, fault tolerance support, and concurrent node installation support. For example, to install a new node, the new node first applies for cluster admission. The new node then requests the symbolic information for new write requests and requests a modified track list comprising an identifier of modified data and an associated symbolic entry. The new node merges the modified track list with any new symbolic entries and then broadcasts availability to remaining nodes in the storage cluster.

Please amend the abstract as follows:

A method, apparatus, and article of manufacture, and a memory structure provide the ability to maintain cache in a clustered environment. The cache is maintained in both a primary and secondary node. for an inter-node network. ~~Nodes are active-active using commodity hardware so that the system can perform I/O together between any number of nodes, and data can be located on any given node. A single modified image is configured to maintain recent and updated data. At least one failure can occur (and be corrected) in the nodes before data is written to disk. A history of access points is kept in a cache directory, and it is assumed that the nodes most frequently accessed in the past are likely to be the most frequently accessed in the near future. One or more embodiments of the invention move this data to where it will likely be needed. This means that data is delivered to hosts quickly, as is required in high volume enterprise web environments. The symbolic list in the cache directory provides a history of the nodes that have previously performed I/O operations. When data is requested, embodiments of the invention look at the a symbolic list in a cache directory is examined to determine which node's cache contains the requested data. If the symbolic list indicates data is not currently in cache of any node, any node may be used as the secondary node. However, if an original primary node maintains the data in cache, the original primary node is selected as the secondary node. Once a new write I/O operation is performed, the symbolic list is updated to provide for the new I/O operation. Additionally, embodiments of the invention provide Fast write support, fault tolerance support, and concurrent node installation support. To install a new node, after applying for cluster admission, symbolic information and a modified track list is requested. The modified track list is merged with new symbolic entries and the new node then broadcasts its availability to the cluster.~~